

IN THE CLAIMS:

Please cancel claim 12 without prejudice and amend the claims as follows:

Claims 1-10 (Cancelled)

11. (Currently Amended) A method for plasma etching in a plasma reactor, comprising:

positioning a work piece in the plasma reactor, the work piece including at least one magnetic material layer selected from NiFe, CoFe, NiFeCo, and Ru and an electron barrier material layer having aluminum oxide;

flowing a plasma source material into the plasma reactor, the plasma source material including HCl;

generating a plasma from the plasma source material; and

exposing the work piece to the plasma to etch the at least one magnetic material layer.

12. (Cancelled)

13. (Currently Amended) The method of claim [[12]] 11 wherein the step of exposing the work piece to the plasma is to etch the electron barrier material layer.

14. (Previously Presented) A method for plasma etching in a plasma reactor, comprising:

positioning a work piece in the plasma reactor, the work piece comprising: at least one magnetic material layer selected from NiFe, CoFe, NiFeCo, and Ru; and an anti-magnetic material layer selected from PtMn and IrMn;

flowing a plasma source material into the plasma reactor, the plasma source material including HCl;

generating a plasma from the plasma source material; and

exposing the work piece to the plasma to etch the at least one magnetic material layer.

15. (Original) The method of claim 14 wherein the step of exposing the work piece to the plasma etches the anti-magnetic material layer.

Claims 16-25 (Cancelled)

26. (Previously Presented) A method for plasma etching in a plasma reactor, comprising:

positioning a work piece in the plasma reactor, the work piece including an anti-magnetic material layer selected from PtMn and IrMn;

flowing a plasma source material into the plasma reactor, the plasma source material including HCl;

generating a plasma from the plasma source material; and

exposing the work piece to the plasma to etch the anti-magnetic material layer.

27. (Original) The method of claim 26 wherein the work piece comprises an electron barrier material layer having aluminum oxide.

28. (Original) The method of claim 27 wherein the step of exposing the work piece to the plasma is to etch the electron barrier material layer.

29. (Original) The method of claim 26 wherein the work piece comprises at least one magnetic material layer selected from NiFe, CoFe, NiFeCo, and Ru.

30. (Original) The method of claim 29 wherein the step of exposing the work piece to the plasma etches the at least one magnetic material layer.

31. (Previously Presented) A method for processing a substrate in a plasma reactor, comprising:

introducing a plasma source material including HCl into the plasma reactor; generating a plasma from the plasma source material; and

exposing the substrate to the plasma to etch a set of layers formed on the substrate, the set of layers having an anti-magnetic material layer and at least two magnetic material layers separated by an electron barrier layer.

32. (Previously Presented) The method of claim 31, wherein introducing the plasma source material comprises flowing the HCl at a rate equal to or greater than any other etchant gases for etching the set of layers.

33. (Previously Presented) The method of claim 31, wherein the other etchant gases comprise at least one of HBr, Cl₂, BCl₃, Ar, N₂ or O₂.

34. (Previously Presented) The method of claim 31, wherein the set of layers comprises at least one of Ni, Fe, Co, Ru or any combination thereof.

35. (Previously Presented) The method of claim 31, wherein the set of layers comprises at least one of Pt, Ir, Mn or any combination thereof.

36. (Previously Presented) The method of claim 31, wherein the electron barrier material layer comprises aluminum oxide.

37. (Previously Presented) The method of claim 31, wherein the anti-magnetic material layer is made from PtMn or IrMn.

38. (Previously Presented) The method of claim 31, wherein the at least two magnetic material layers are made from NiFe, CoFe, NiFeCo, or Ru.

39. (Previously Presented) The method of claim 31, wherein exposing the substrate to the plasma to etch the set of layers comprises etching through openings defined in at least one masking layer formed over the set of layers.

40. (Previously Presented) The method of claim 39, wherein the at least one masking layer comprises a layer of a resist and a layer of an amorphous carbon is formed over the set of layers.

41. (Previously Presented) The method of claim 39, wherein the at least one masking layer comprises a layer of a resist and a layer of a hydro-carbon polymer resin is formed over the set of layers.

42. (Previously Presented) The method of claim 31, further comprising, after exposing the substrate to the plasma, exposing the substrate to a second plasma formed from a second plasma source material including a hydrogen and fluorine gas.

43. (Previously Presented) The method of claim 42, wherein the substrate is exposed to the second plasma in a second plasma reactor.

44. (Previously Presented) The method of claim 42, wherein the hydrogen and fluorine gas is selected from CHF₃, CH₂F₂, or CH₃F.

45. (Previously Presented) The method of claim 31, wherein the anti-magnetic material layer is made from PtMn or IrMn and the at least two magnetic material layers are made from NiFe, CoFe, NiFeCo, or Ru.

46. (Currently Amended) [The method of claim 11, wherein the work piece further comprises] A method for plasma etching in a plasma reactor, comprising:

positioning a work piece in the plasma reactor, the work piece including at least one magnetic material layer selected from NiFe, CoFe, NiFeCo, and Ru and an anti-magnetic material layer;

flowing a plasma source material into the plasma reactor, the plasma source material including HCl;

generating a plasma from the plasma source material; and
exposing the work piece to the plasma to etch the at least one magnetic material layer.

47. (Previously Presented) The method of claim 46, wherein the step of exposing the work piece comprises etching the anti-magnetic material layer.

48. (New) The method of claim 11, wherein the plasma source material further includes N₂, O₂ or any combination thereof.